REBUTTAL TESTIMONY

OF

HENRY E. DELK, JR.

ON BEHALF OF

DOMINION ENERGY SOUTH CAROLINA, INC.

DOCKET NO. 2020-125-E

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS AND POSITION WITH DOMINION ENERGY SOUTH CAROLINA, INC. ("DESC" OR "COMPANY").

A. My name is Henry E. Delk, Jr., and my business address is 220 Operation Way, Cayce, South Carolina 29033. I am employed by DESC as General Manager, Fossil Hydro Operations.

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND AND YOUR BUSINESS EXPERIENCE.

A. I graduated from Clemson University in 1993 with a Bachelor of Science degree in Mechanical Engineering and earned a Master of Business Administration degree from the University of South Carolina in 2000. I began my career with Milliken & Company in 1993 working as a Process Improvement Engineer. After three years, I accepted a position with Clariant Corporation as a Project Engineer. I began my career with DESC, then South

Carolina Electric & Gas Company ("SCE&G"), in 1997 in the Rate Department as a Rate & Regulatory Specialist. In 2000, I transferred to Electric Transmission and assumed a position within the System Control department as a System Controller. Within Electric Transmission, I served as Supervisor/Manager of Operations Planning from 2001 to 2007 and Manager of System Control from 2007 to 2012. I transferred to the Electric Operations division and worked from 2012 to 2013 as Manager of Northern Division Transmission Operations and Local Manager of the Lexington and Chapin Crew Quarters. From 2013 to 2014, I served as Director of Power Marketing. I assumed the role of General Manager, Fossil Hydro Technical Services in June 2014. In September 2017, I assumed my current position as General Manager, Fossil Hydro Operations.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to the testimony of Sierra Club witness Elizabeth A. Stanton, PhD, regarding the cost of capital maintenance projects, environmental upgrades and other capital projects associated with the Company's four coal-fired generating units located at Wateree Station, Williams Station and Cope Station.

Q. WHY DOES DR. STANTON FOCUS ON THOSE UNITS?

A. I am uncertain as to why Dr. Stanton focuses on these units other than the fact that the units at Wateree, Williams and Cope are the last four remaining coal-fired units of a fleet that recently numbered twelve. Since 2002, Canadys Units 1, 2 and 3 have been retired, while Urquhart Units 1, 2 and 3 and McMeekin Units 1 and 2 have been converted to gas-fired operation only.

Q. WHY HAVE THE WATEREE, WILLIAMS AND COPE STATIONS NOT BEEN RETIRED?

A. The Wateree, Williams and Cope units are large, well-maintained and highly reliable coal-fired generating units that have been fitted with a complete suite of environmental control equipment to ensure that they comply with all current regulatory requirements. As coal units, they have secure fuel sources located on-site and held in inventory for use when needed. They represent approximately 1,709 megawatts ("MW") of generation capacity, which is critically important to the Company's ability to serve its customers' peak demand of approximately 5,000 MW.

Q. DO ANY OF THESE THREE STATIONS PROVIDE A PARTICULARLY IMPORTANT OPERATIONAL BENEFIT TO THE SYSTEM?

A. Yes. While all of them provide operational benefits to the system, Williams Station, which is located on the Cooper River just north of Charleston, is of particular importance. Due to the lack of dispatchable base load generating capacity in the South Carolina Low Country, it can be difficult to maintain reliable voltage in Charleston and surrounding areas. That is the case both on our system and increasingly, on that of the system of the South Carolina Public Service Authority ("Santee Cooper") with whom we are interconnected. Williams Station represents 610 MW of reliable, dispatchable base load capacity that is located within the Charleston area. Because of the increasing lack of other dispatchable generation in this area, the 610 MWs of highly reliable capacity provided by Williams Station is of critical importance to maintain reliable service to customers in the Charleston area under high load conditions and when other generation units or transmission assets are out for maintenance or repairs.

Q. IS IT POSSIBLE THAT THESE THREE PLANTS MAY BE RETIRED IN THE FUTURE?

A. Potentially, yes. Dominion Energy, Inc. has a net zero-carbon emission goal by 2050 with interim targets it intends to meet by 2030. It is possible that in keeping with these commitments, the Company will decide to retire some, if not all, of these plants in the future. Doing so would require replacing these plants with other dispatchable generation resources. The Company would have to coordinate the retirements with the procurement of dispatchable resources to replace them so that there is no gap in our ability to reliably serve customers. Until they are replaced, these three plants will continue to represent a vitally important source of reliable, dispatchable, and economical power that is crucial to the Company's ability to provide reliable service to customers. Without them, we do not currently have sufficient generation resources to meet customer demands during peak periods and when other generation units or transmission assets are out for maintenance or repairs.

Q. WOULD IT NOT BE POSSIBLE TO PURCHASE CAPACITY TO REPLACE THESE UNITS FROM THE GRID?

A. No. Just like us, our neighboring utilities have designed their systems to meet the needs of their native customers. During peak periods, there is often little or no firm Available Transfer Capability ("ATC") on their transmission systems to deliver sufficient power into our system, especially in the amounts needed to replace the Wateree, Williams and Cope units. This is true even if energy and generation capacity are available for purchase, which is not always the case.

Q. SPECIFICALLY, WHAT DOES DR. STANTON PROPOSE CONCERNING THE CAPITAL THAT HAS BEEN SPENT ON MAINTAINING OR UPGRADING WATEREE STATION, WILLIAMS STATION AND COPE STATION?

A. Dr. Stanton proposes that the Company be ordered to write-off as imprudent all capital maintenance, environmental projects and other capital spent on the Wateree, Williams and Cope units since the close of the test period in the last rate proceeding (December 31, 2011). She also proposes that future capital expenditures on these plants be capped and subject to special regulatory review.

Q. DOES DR. STANTON POINT TO ANY INFORMATION OR STUDIES FROM THE 2011 OR 2012 PERIOD THAT WOULD HAVE INDICATED THAT IT WAS NOT REASONABLE OR PRUDENT TO CONTINUE TO MAINTAIN THESE UNITS?

A. No. She does not point to any information or studies from the period 2011-2012, or indeed thereafter, to indicate that continuing to maintain these plants was unreasonable or imprudent.

Q. WHAT THEN IS THE BASIS FOR DR. STANTON'S PROPOSAL?

A. Her proposal is based on recent analyses she has conducted that she claims show that Wateree, Williams and Cope Stations are "unreliable" generating units and that the Company is "losing money" on them.

Q. ARE THOSE CLAIMS CORRECT?

A. Not at all. Those claims could not be further from the truth.

THE RELIABILITY OF THE WATEREE, WILLIAMS AND COPE UNITS

Q. PLEASE EXPLAIN WHY DR. STANTON'S ASSERTIONS CONCERNING THE RELIABILITY OF THE WATEREE, WILLIAMS AND COPE UNITS ARE INACCURATE.

A. In her testimony and analysis, Dr. Stanton confuses very different concepts related to generation operations. One is availability factor, which is used to measure a generation unit's availability to serve load during the period in question whether due to scheduled maintenance or other reasons. Another is the forced outage rate, which is a measure of the unavailability of the unit to serve load when no scheduled outage had been planned. A third, capacity factor, measures the actual reliance the system placed on that unit during the period in question based on economic dispatch.

Q. PLEASE EXPLAIN AVAILABILITY FACTORS, FORCED OUTAGE RATES AND CAPACITY FACTORS AND WHAT EACH MEASURES.

A. A unit's availability factor is the percentage of time which that unit was available to serve customers' needs, whether or not it was called on to do so by economic resource planners or system dispatchers. It measures the availability of the resource to serve load across a period of time. While availability factor is impacted by forced (unplanned) outages, it is also impacted by scheduled/planned outages utilized for maintenance, repairs or upgrade projects that may be undertaken to avert future forced outages and enhance reliability. All generating units must undergo scheduled outages for things like equipment replacement, environmental upgrades, turbine maintenance, and safety improvements. Scheduled outages are normal in the course of prudent utility operations. They are scheduled for times when other resources are expected to be sufficient to meet customers' demands and are accounted for in system planning. In this way, their effects on the system are minimized.

Because the availability factor counts scheduled and forced outages equally, it is not as direct a measure of a unit's reliability during the times when economic resource planners and dispatchers would otherwise expect them to be available. That day to day reliability is measured by the unit's forced outage rate, which represents the percentage of time a unit was forced off line when no scheduled or planned outages were on the books. Forced outage rates measure the inability of the economic resource planners and dispatchers to rely on a unit to serve load as expected.

Capacity factors measure something entirely different. They measure the degree to which the economic resource planners or system dispatchers in fact called on a unit to serve customers' needs and the unit in fact was able to respond. In theory, a unit could be 100% reliable with an availability factor of 100%, but could have a 0% capacity factor if lower fuel-cost units were available during that period and economic resource planners kept the unit in reserve to minimize fuel costs. The point is that capacity factors should not be conflated with reliability.

Q. PLEASE EXPLAIN THE DIFFERENCE BETWEEN THESE AVAILABILITY FACTORS AND CAPACITY FACTORS AS THEY RELATE TO WATEREE STATION, WILLIAMS STATION AND COPE STATION.

A. Coal units like the Wateree, Williams and Cope units are designed, built and maintained to operate reliably and continuously for many thousands of hours a year. As you might expect, coal-fired units typically have high availability factors. And that is true of the Wateree, Williams and Cope units.

Capacity factor is a different matter. Over time, a coal unit's capacity factor is primarily determined by the cost of the fuel it must burn per megawatt hour ("MWh") produced compared to the alternative plants and fuel sources available to the system. In most cases, the alternative to one coal unit is either another coal unit (which may have a different heat rate or efficiency) or a combined cycle or other natural gas-fired unit (which will have a different fuel cost altogether). In practice, the relationship between as-fired coal prices and as-fired natural gas prices per MWh generated is the principal determinant of whether coal or gas units will have the higher capacity factors.

Q. HOW HAS THE RELATIONSHIP BETWEEN COAL PRICES AND NATURAL GAS PRICES CHANGED IN RECENT YEARS?

A. Before 2010, on an as-fired per MWh basis, coal units were generally significantly lower than natural gas units. For that reason, economic resource planners and system dispatchers typically held gas units in economic reserve for much of the year and used them to meet customers' needs during peak demand months, or when other units were off-line for scheduled maintenance or repairs. Coal units, with their lower fuel costs, were base loaded.

Over the past decade, the relationship between coal and natural gas prices has changed. Hydraulic fracturing has caused a dramatic and sustained drop in natural gas prices. It has made vastly greater amounts of economically recoverable natural gas available to the market. As a result, coal generation and natural gas generation changed places in the economic dispatch rankings. Today, high-efficiency natural gas units are dispatched as much as possible to take advantage of their lower fuel costs and high efficiency in converting natural gas to electricity. DESC's coal units are often held in economic reserve to be brought on line to serve customers' needs during peak load months or when other units are down for scheduled maintenance. These coal units are dispatched when needed and provide over 1,700 MW of capacity to maintain reliability during the times of greatest customer demand, just as the gas fueled units did in prior years.

Q. HOW DO YOU RESPOND TO DR. STANTON'S ASSERTION THAT THE WATEREE, WILLIAMS AND COPE UNITS "HAVE SEEN SHRINKING CAPACITY FACTORS SINCE 2012?"

A. This change in capacity factors is exactly what would be expected in light of the sustained low natural gas commodity prices seen since 2010 and actually illustrates the prudency of our operations over those years. To reduce fuel costs, the Company began to base load natural gas generation and hold coal in economic reserve. Changing capacity factors do not indicate problems of any kind. Coal generation continues to be a reliable and critically important component of the Company's diversified generation portfolio, especially during peak periods where we have shown that those units are highly available and reliable.

Q. HOW DO THESE FACTS RELATE TO DR. STANTON'S ASSERTION THAT THE WATEREE STATION, WILLIAMS STATION AND COPE STATION ARE "UNRELIABLE?"

A. In her testimony (specifically at pages 11-14 of her prefiled direct testimony), Dr. Stanton talks extensively about the Wateree, Williams and Cope units being "unreliable" or subject to long periods of "outages." She presents availability (but not forced outage) data for the years 2018, 2019 and 2020, conveniently all years where the Company executed major scheduled outages at each of the three coal plants. These were necessary outages that were done to ensure their on-going reliable operations to serve customer loads. By focusing on this three-year period, Dr. Stanton creates the factually-inaccurate impression that Wateree Station, Williams Station and Cope Station are unreliable. She also leads into her discussion of reliability by citing data concerning capacity factors that are not related to the reliability conclusions that follow at all. Based on this approach, she testifies that the Wateree, Williams and Cope units "are not reliable sources for meeting customers' energy needs" and so their costs should be disallowed.[1] This assertion is not factually accurate in any respect. The Wateree, Williams and Cope units are highly reliable units on our system, their availability factors have been quite high over the period since 2011, and their forced outage rates are quite low.

Q. YOU SAY THAT AVAILABILITY FACTORS FOR WATEREE, WILLIAMS AND COPE ARE SELECTIVELY REPRESENTED IN DR. STANTON'S TESTIMONY. ARE VALID AVAILABILITY FACTORS FOR THE COMPANY'S COAL UNITS PUBLICALLY AVAILABLE?

A. Yes. The availability factors for the Company's coal units are presented each year as part of the factual record in each electric fuel clause case under S.C. Code Ann. § 58-27-850 and have been reported this way for

[1] Stanton Prefiled Direct Testimony at p.15.13-14.

a number of years. They are reviewed each year by ORS, the Commission and the parties to those proceedings. The Company presents information for its coal units that focuses on the winter and summer peak demand months when the capacity represented by our coal units is most valuable to customers and when they are now being called on most frequently.

The forced outage rate for the Company's fossil steam units is presented in Company witness Mr. Kissam's direct testimony at Graph C. It shows that for the years 2014-2019 the forced outage rate for the Company's fossil steam plants (*i.e.*, coal plants and former coal plants converted to natural gas only status) was less than 3% in all years, compared to a national average that was approximately 8.5%. This reflects a high level of reliability.

Q. HAVE YOU COMPUTED COMPARABLE FORCED OUTAGE RATES FOR THE WATEREE, WILLIAMS AND COPE UNITS SPECIFICALLY?

A. Yes. That rate was 5.21%. Historically, from 2012 to 2019, the winter peak months forced outage rate was 4.62%, and the summer peak months forced outage rate was 6.28%.

Q. HOW DO YOU RESPOND TO DR. STANTON'S ASSERTION THAT THE EVENTS RELATED TO THE WATEREE UNIT NO. 2 HYDROGEN LEAK CALL THE RELIABILITY OF THAT PLANT INTO QUESTION?

A. The Wateree units have a strong track record of reliability over time. The 2020 event related to the hydrogen leak at Wateree Unit 2 was not, as Dr. Stanton implies, an indication of systemic reliability issues with this unit or any of the DESC-operated coal units. This was an isolated incident, as the unit's forced outage rates and availability factors in prior years show.

Q. WHAT WERE THE CIRCUMSTANCES?

A. In February 2020, while Wateree Unit No. 2 was off line in economic reserve, the combination of an improperly positioned section of piping and a failed isolation valve allowed hydrogen gas to bleed into the generator housing, where it mixed with oxygen and caused a small explosion internal to the generator area. The damage was quite limited and confined within the generator stator casing. There was no external damage. However, several rubber baffles that direct gas flow within the stator were dislocated. These baffles, although not particularly expensive themselves, cannot be replaced without entirely disassembling and rebuilding the stator. To minimize costs and execution risks, the stator is being replaced with a new factory-built unit and is not being rebuilt on site. The root cause of the incident was thoroughly investigated, and the hydrogen piping system has been redesigned and replaced. Procedures have also been updated to ensure a similar event does not happen again at Wateree or on any of DESC's hydrogen-cooled generators (Columbia Energy Center, Cope, McMeekin, Jasper, Urquhart, and Williams).

Q. IN CONCLUSION, HOW DO YOU RESPOND TO DR. STANTON'S TESTIMONY RELATED TO THE RELIABILITY OF WILLIAMS, WATEREE AND COPE?

A. Dr. Stanton presents an entirely inaccurate picture of the reliability of DESC's coal plants. She does so by focusing on availability factors during a narrow range of years when the three coal units were undergoing a series of scheduled outages, failing to consider forced outage rates, and presenting information concerning capacity factors while her arguments focus on reliability. This creates the impression that these highly reliable units, which at times were undergoing scheduled maintenance or were held in economic reserve to achieve fuel cost savings, were not reliable or valuable to the system. This impression is entirely inaccurate. The Williams, Wateree and Cope units have consistently achieved high availability factors and low forced outage rates over the decades they have been in service. They are an extremely valuable part of our system. If retired, they would be very expensive to replace, and would have to be replaced with other similarly dispatchable generation resources in order for us to reliably serve our customers.

THE VALUE TO CUSTOMERS OF THE WATEREE, WILLIAMS AND COPE UNITS

Q. HOW DO YOU RESPOND TO DR. STANTON'S TESTIMONY THAT IT COSTS MORE TO OPERATE WILLIAMS, WATEREE AND COPE "THAN THEY GENERATE IN REVENUES?"

A. Dr. Stanton's assessment has two fundamental flaws. First, it ascribes no value to the 1,709 MW of net dependable generation capacity that the Wateree, Williams and Cope units represent. The full cost of replacing that capacity will involve costs that will only be fully quantified when the series of retirement studies that the Company has committed to undertake are completed, and the cost of transmission upgrades and other actions to support service to the Charleston area, and potentially natural gas pipeline upgrades, are all factored in. The first of these studies is getting underway now. In any event, replacing these units will take years of planning, procurement, siting and construction. As to cost, Company witness Neely has provided an indicative analysis, not including transmission costs and pipeline costs, using data from DESC's recent Integrated Resource Plan (IRP) docket. He computes that the annual cost to customers of replacing these units with combined cycle gas generation, looking only at the capital cost of replacement units themselves, would be on the order of $330 million per year.

By contrast, the incremental capital spent keeping the Wateree, Williams, and Cope Stations reliably available and in environmental compliance since 2012 was $411 million or approximately $50 million per year. This is a fraction of what customers would have had to pay per year in increased rates to support the retirement and necessary replacement of these three plants.

Q. WHY WOULD IT BE NECESSARY TO REPLACE THESE PLANTS IF THEY WERE RETIRED AS DR. STANTON ASSERTS THEY SHOULD BE?

A. The Wateree, Williams and Cope units represent approximately 1,709 MW of the generation capacity. That represents a large part of the capacity needed to serve DESC's existing peak demand of approximately 5,000 MW, without accounting for any future system growth. There would be no way to retire the Wateree, Williams and Cope units without replacing them with dispatchable generation. In addition, these units represent firm, dispatchable capacity with secure on-site fuel sources that are not subject to the constraints and operational flow orders that can occur on the natural gas pipelines that serve our gas-fired generation units today. They represent a valuable source of fuel diversity on our system, especially Cope with its ability to fire both coal and/or natural gas (as available). To replace this much capacity with reliable, dispatchable generating capacity would likely require, at minimum, adding gas fired generation along with construction of new pipeline capacity.

Q. IN CONCLUSION, HOW DO YOU RESPOND TO DR. STANTON'S ANALYSIS RELATED TO THE ECONOMIC VALUE OF WATEREE, WILLIAMS AND COPE?

A. In my opinion, Dr. Stanton's analysis, which attempts to show that the Wateree, Williams and Cope units have not earned "revenue" sufficient to support their continued operation, is without validity. In addition, she is inaccurate in her representation of the availability of our coal units over time. The conclusions presented are contradicted by the facts, including the cost of replacing the dispatchable generation that the Wateree, Williams and Cope units represent and the avoided cost of energy as approved by this Commission.

Q. WHAT ARE YOU REQUESTING THE COMMISSION TO DO?

A. I request that the Commission deny the Sierra Club's requests related to the Wateree, Williams and Cope units.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, it does.